POTENTILLA CANADENSIS AND P. SIMPLEX

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(Plates 214 and 215)

DURING a recent correspondence with Professor H. O. Juel, regarding Kalm's American plants preserved at Upsala, Professor Juel referred to *Potentilla pumila* Poir. as identical with *P. canadensis* L. When this identification of the two first came to my attention I at once wrote Professor Juel that Rydberg (in his *Monograph of the North American Potentilleae*[1] and in his elaboration in the North American Flora[2]) and, consequently, other American botanists, who have automatically followed Rydberg, are treating *P. canadensis* and *P. pumila* as wholly different species. It soon became clear, however, that, although Michaux, Nestler, Hooker and some American botanists of the first half of the last century and some in the first years of the present century had properly identified the species, American botanists in recent years have wholly misinterpreted both *P. canadensis* L. and *P. simplex* Michx., as well as *P. caroliniana* Poir. and, to some extent, *P. sarmentosa* Muhl.

In his article, *A Revision of Kalm's Herbarium in Upsala*,[3] a paper which should be carefully studied by American taxonomists, Professor Juel, in 1921, really settled the identity of *Potentilla canadensis:*

> *Potentilla canadensis* L. A specimen, so determined by KALM. It belongs to the species which in modern American floras is called *P. pumila* POIR.
>
> The description of P. canadensis given by LINN. from KALM'S specimens contains these words: "habitus Fragariae," "caulis digitalis," and "similis P. vernae." These characteristics suit the plant called P. pumila POIR. far better than the P. canadensis of the American floras, for the latter is a much taller plant with little resemblance to P. verna L. I therefore think that P. pumila POIR. is what LINN. meant by his P. canadensis, and that it ought accordingly to be called by the latter name. The "P. canadensis" of modern authors should then be re-named.

In a letter of November 23, 1930, Professor Juel wrote: "I have seen the specimen in Linné's herbarium in London on which he has written '15 K canadensis.' It was collected by Kalm, as indicated by the letter K. I made this note about it: 'is quite small, even as Kalm's own specimen, evidently—P. pumila Poir.'" I, too, examined the Kalm specimen in the Linnean herbarium about thirty years ago and have a good photograph of it before me. On the basis of this and earlier identifications and identification of the type of *P. simplex* Michx.,

[1] Rydberg, Mem. Dept. Bot. Columbia Univ. ii. 35–37 (1898).
[2] Rydberg in N. Am. Fl. xxii[4]. 302, 303 (1908).
[3] Juel, Svenska Linné-Sällskapets Årsskr. iv. 19, 20 (1921).

New England botanists during the first decade of the present century were correctly using the names *P. canadensis* and *P. simplex*, an understanding reflected in the Flora of Vermont (1900) by Brainerd, Jones & Eggleston. In a foot-note from their record of "**P. simplex**, Michx. (P. Canadensis of American authors in part.)", they said: "Just as this is going to press a letter is received from M. L. Fernald stating that '*Potentilla simplex* Michx. is the common sprawling species of New England, while *P. Canadensis* is a low, hardly repent, canescent species which hardly reaches southern Maine and New Hampshire.' It was not possible to re-examine Vermont specimens other than those in the herbarium of the University of Vermont. All of those proved to be *P. simplex*."[1] In keeping with this understanding of the New England botanists at that period it is significant that of the 28 numbers of *P. canadensis* collected between 1895 and 1905 and represented in the herbarium of the New England Botanical Club 25 were correctly named; but that of the 68 numbers in the same herbarium collected from 1908 to 1918 62 bear the wrong name!

This complete reversal was due to the fact that, in deference to the treatment in Rydberg's *Monograph*, the application of the names was unfortunately reversed in the 7th edition of Gray's Manual. The photograph of the actual Linnean type (PLATE 214, FIG. 1) a small specimen received from Kalm, and the photograph of Kalm's better specimen preserved at Upsala (PLATE 214, FIG. 2), generously supplied by Professor Juel, clearly demonstrate, however, that, as he pointed out ten years ago, *P. canadensis* L. is the plant passing in current American treatments as *P. pumila* Poir. Poiret's *P. pumila* was well described and, like the Linnean species, was compared by its author with *P. verna;* also with *P. acaulis*. I have, as yet, been unable to see a photograph of it, but the description is so clear that there is no reasonable doubt that *P. pumila* Poir. is *P. canadensis* L.

The species which in recent years has erroneously passed in America as *Potentilla canadensis* is a much coarser plant than true *P. canadensis*, with the firm flowering stem erect or strongly ascending, but after anthesis becoming procumbent and sending out many prostrate branches which root at tip. It has three fairly marked extremes: one, called by Rydberg and others "*P. canadensis*," with "stems . . . generally with spreading pubescence" (*Rydberg*, N. Am. Fl.) or "spreading-hirsute" (*Robinson & Fernald* in Gray, Man. ed. 7) and

[1] Brainerd, Jones & Eggleston, Fl. Vt. 51 (1900).

extending northward only to southern Ontario, southern Quebec and southwestern New Brunswick; a second extreme, more common northward, the plant treated by Rydberg (N. Am. Fl.) as *P. simplex* Michx., by Robinson & Fernald as *P. canadensis*, var. *simplex*. This plant has the "stem . . . erect . . . appressed-pubescent" (*Rydberg*) or "covered *with* shorter *appressed or subappressed hairs or glabrate*" (*Robinson & Fernald*) and it extends north to the Laurentide region of Quebec, northern Maine, Prince Edward Island, Cape Breton and Newfoundland. The third extreme is like the first but with the lower surfaces of the leaves densely silvery-silky, a plant of the interior, from Pennsylvania to Illinois and adjacent regions. As geographic varieties the three are very good, quite parallel with the varieties of *Fragaria vesca* and of *F. virginiana*.

That the tall plant which has recently been passing as *Potentilla canadensis* is not the Linnean *P. canadensis* is now clear, and when the original description of *Potentilla simplex* Michx. is examined it is quickly obvious that Rydberg and, following him, Robinson & Fernald and others, have been misapplying that name also, for Michaux had, not the plant with "appressed-pubescent" or "glabrate" stems, but the extreme which has recently been erroneously called *P. canadensis*. Michaux's diagnosis of his *P. simplex* was unequivocal: "P. erecta, simplex, hirsuta," and his species carefully studied[1] by Nestler, was beautifully illustrated[2] by him. Nestler's illustration (here reproduced as PLATE 215, FIG. 1) of the Michaux type certainly represents the "*P. canadensis*" of recent American authors, and my own decision after examination of the Michaux material was wholly in accord with this interpretation. So far as I can find, the common smoother plant, the only one extending far to the north, which has been erroneously identified as *P. simplex*, has no name; nor can I find a name for the argenteous extreme of the interior.

In the mountains of Virginia and eastern Tennessee and on the Ozark Plateau of southern Missouri there is a plant with cuneate-obovate leaflets, flabelliform or filiform repent stolons and a very conspicuous villosity on petioles, stems, calyx and both leaf-surfaces. This is the plant treated by Rydberg in the North American Flora as

[1] "Parisiis herbaria *Tournefortii*, *Vaillantii*, *Michauxi*, nec non locupletissimum thesaurum Musaei historiae naturalis pervolvi; cujus Administratores mihi insignitur faverunt ut species tam novas quam iconibus nondum illustratas in lucem ederem."—Nestler, Monog. Potent. p. ii (1816).

[2] Nestler, l. c. 25, 40, t. ix. fig. 2 (1816).

Potentilla caroliniana Poir. in Lam. Encyc. v. 595 (1804). Rydberg correctly describes the Tennessee and Missouri plant as having "stems prostrate, . . . usually rooting at the nodes, . . . with spreading pubescence; . . . petioles . . . with coarse usually reflexed hairs; leaflets broadly obovate with a cuneate base, coarsely toothed above, . . . loosely pubescent with long and spreading hairs on both sides; stem-leaves similar but small."[1] Poiret, however, said that *P. caroliniana* had the stems firm and stiff and the leaflets ovate-oblong and serrate-dentate around their margins (not merely above): "*foliolis ovato-oblongis*, . . . facile à reconnaître par ses folioles ovales, oblonges, . . . Ses tiges longues d'un pied, assez fermes, velues, . . . droites . . . folioles . . . divisées en dents de scie assez fortes à leur contour." Poiret's description at once suggests *P. simplex* Michx. and Nestler, when he "turned over (pervolvi)" the specimens at Paris performed an "autopsy" on Poiret's type. The result was that the only synonym of *P. simplex* given by Nestler was "*P. caroliniana Poiret Encycl. 5. p. 595.* (ex autopsia herb. Lamarck)"[2]; and Lehmann in his Monographia (1820) correctly made *P. caroliniana* a synonym of *P. simplex*.

The most extreme specimens of "*P. caroliniana*" Rydb., not Poir., suggest the possibility that they represent a definite specific type, but one of the collections from Tennessee and the material from Virginia, although having the long villosity of the Missouri plant, are otherwise inseparable from typical sericeous *P. canadensis* of the Coastal Plain and Piedmont areas to the east. It is most probable that Rydberg's "*P. caroliniana*" is the primitive type (now found on the Ozark and Appalachian Uplands) from which the more sericeous *P. canadensis* of the Atlantic coastwise area and the eastern Great Lake region was derived.[3] So far as I can ascertain this very villous plant has no name; it must be treated as a geographic variety of the latter species.

Another name which has to be considered is *Potentilla sarmentosa* Muhl. in Willd. Enum. Pl. Hort. Berol. 554 (1809). The description, "folliis . . . obovatis grosse serratis . . . caule procumbente sarmentoso," and Willdenow's statement that it is similar to the prostrate *P. reptans* might apply either to mature *P. canadensis* or

[1] Rydb. N. Am. Fl. xxii.[4] 303 (1908).

[2] Nestler, l. c. 40 (1816).

[3] For consideration of this relationship see Fernald, *Specific Segregations and Identities in some Floras of eastern North America and the Old World*, Rhodora, xxxiii. pp. 38–60 (1931).

to the midsummer and autumnal procumbent state of *P. simplex.* Both interpretations were soon made by students of the group. Nestler (1816) did not know the plant, but simply compiled his description. Lehmann (1820), after examining the original material, placed *P. sarmentosa* in the synonymy of *P. simplex;* but in 1834 Hooker placed it, with reservations, under both *P. canadensis* and *P. simplex.* In the discussion of *P. canadensis* (with *P. pumila* and *P. sarmentosa* as synonyms) Hooker said, "Dr. Boot's specimens of '*P. sarmentosa* of Muhl.,' (and Willd.?), precisely accord with Dr. Torrey's, and with Nestler's description and figure [of *P. canadensis*]. It may be a state of *P. simplex* before the appearance of the runners, but the leaflets are broader and much paler, and silky beneath."[1] Then in the synonymy of *P. simplex,* Hooker gave, besides *P. caroliniana,* "P. sarmentosa. *Willd.* (fide *Lehm.* ex specim. in *Herb. Willd.*) an *Muhl.?*"

The confusion as to the exact identity of *Potentilla sarmentosa* is now, fortunately, cleared, for Professor Diels has most kindly supplied me with very clear photographs of the original material in the Willdenow Herbarium. There are two specimens, each a characteristic runner: sheet no. 2 (our PLATE 215, FIG. 3) with the most characteristic foliage and the appressed pubescence of *P. canadensis* (*P. pumila*), the other, sheet no. 1 (our PLATE 215, FIG. 4) with the foliage and stipules and the hirsute petioles of *P. simplex.* In other words, *P. sarmentosa* was based on runners of both *P. canadensis* and *P. simplex* and was a perfect case of a *nomen confusum.* As already noted, the earlier students of our flora and of the genus *Potentilla* had a far more accurate understanding of the species just discussed than their successors have usually shown. Michaux in 1803 clearly differentiated the two species as *P. canadensis* and *P. simplex.* Nestler, in 1816, basing his conclusions on personal examination of the types of Michaux, Poiret and others at Paris, published an authentic plate of *P. simplex* and unequivocally reduced *P. caroliniana* to it. He correctly understood *P. canadensis* and illustrated it, apparently from material collected by Michaux. In 1818, Amos Eaton[2] correctly defined both *P. canadensis* and *P. simplex,* even to noting the slight but fairly constant difference in the petals (in *P. canadensis* "subentire," in *P. simplex* "round-obcordate"), but he treated *P. pumila* as a third species, for

[1] Hook. Fl. Bor.-Am. 1. 192 (1834).
[2] Eaton, Man. ed. 2: 378, 379 (1818).

which *P. canadensis* "may be mistaken." Lehmann, in 1820, correctly understood the two species; in 1824 Jacob Bigelow[1] gave the best characterizations of the two ever published, calling them *P. sarmentosa* (*P. canadensis* being unknown to him) and *P. simplex;* and, as already noted, Hooker correctly understood the two species in 1834.

Torrey & Gray, in 1840,[2] lost sight of the numerous characters (10 contrasting characters enumerated in the synopsis at the end of this paper) and treated the three plants recognized by them as variations of one species and in 1843 Torrey went so far in his failure to understand the plants as to write of *P. canadensis:* "Early in the spring . . . it is the *P. pumila* of Poiret. Later in the season . . . it is the ordinary *P. Canadensis.* Its smoother and more erect state . . . is the *P. simplex* and *P. sarmentosa* of authors."[3] From then on, the two species remained merged as one variable species in the treatments of Gray, Lehmann (Revis. Pot., 1856), Wolf and others; and in 1891 Britton emphasized his merging of them by publishing a special note, saying: "a study of the plant during the past spring in the vicinity of New York has convinced me that *simplex* cannot be separated [from *P. canadensis*] even as a variety, for I found them growing from the same clump. In shaded woodlands the *simplex* condition prevails, while the other prefers open places, and reaches its extreme degree of depression (var. *pumila* T. and G.) in very dry, sterile soil. There is, therefore, no more reason for maintaining varieties in it than in the case of *Erigeron Canadense*, which varies from an inch in height to ten feet or more."[4] More recently, however, everyone who has an intimate field-knowledge of our flora has realized that there are two quite distinct species (Rydberg even treating them as four). If, in reviving the old names in 1898, the original descriptions and their types had been more carefully considered or if Nestler's first-hand identifications of the species of Michaux and of Poiret had been given the weight they deserve, much unnecessary recent confusion could have been avoided.

Since the present paper almost completely realigns the names in the group, it is important to include a brief synopsis of the plants involved and their essential bibliography.

POTENTILLA CANADENSIS L. Dwarf: rhizome premorse, cylindric, in well-developed plants 0.5–2 cm. long, 4–8 mm. thick: stolons not

[1] Bigelow, Fl. Bost. ed. 2: 204 (1824).
[2] Torr. & Gr. Fl. N. Am. i. 443 (1840).
[3] Torr. Fl. N. Y. i. 208 (1843).
[4] Britton, Bull. Torr. Bot. Cl. xviii. 366 (1891).

bearing tuberous enlargements at their tips: stems at flowering time 0.1–1.5 dm. high, soon becoming prostrate, filiform or flagelliform, 0.3–1 mm. thick: cauline leaves during anthesis not well expanded (those subtending flowers 0.5–3 cm. long, including the petiole, at expansion of the flower); leaflets narrowly cuneate-obovate, coarsely and deeply 5–15-toothed around the rounded summit, entire and cuneate from near the middle; the middle leaflet of the largest leaves (of each plant) 1.5–4 cm. long (—6 cm. in var. *villosissima*): free blades of the basal stipules oblong-lanceolate, flat; stipules (mostly 3-cleft) of mature primary cauline leaves 4–12(–15) mm. long: first flowers usually borne from the node above the first well-developed internode: petals rounded at summit or retuse: first flowers expanded in eastern Massachusetts April 2–June 7.

Two well-marked varieties:

Young growth (stems, petioles, lower leaf-surfaces, calyx, etc.) silky-pilose with appressed or loosely ascending fine pubescence . . Var. *typica*.
Young growth long-villous, the pubescence of stems, petioles, peduncles and calyx loosely spreading to reflexed . . . . . Var. *villosissima*.

Var. **typica**. *P. canadensis* L. Sp. Pl. i. 498 (1753); Michx. Fl. Bor.-Am. i. 303 (1803); Nestler, Monog. Potent. 27, 58, t. x. fig. 1 (1816); Hook. Fl. Bor.-Am. i. 192 (1834). *P. pumila* Poir. in Lam. Encycl. v. 594 (1804); Rydb. in Britt. & Br. Ill. Fl. iii. 515, fig. 1935a (1898), in ed. 2, ii. 251, fig. 2229 (1913), Mem. Dept. Bot. Columbia Univ. ii. 37, t. 18, figs. 1 and 2 (1898), in N. Am. Fl. xxii[4]. 303 (1908); Robinson & Fernald in Gray, Man. ed. 7: 484 (1908). *P. sarmentosa* Muhl. in Willd. Enum. Pl. Hort. Berol. 554 (1809), in part (no. 2 in herb. Willd.); Bigel. Fl. Bost. ed. 2: 204 (1824). *P. canadensis*, β. *pumila* (Poir.) Torr. & Gr. Fl. N. Am. i. 443 (1840); Gray, Man. 122 (1848). *P. canadensis*, β. *sarmentosa* Wood, Class-Bk. 104 (1845). *Callionia canadensis* (L.) Greene and *C. pumila* (Poir.) Greene, Leaflets, i. 238 (1906).—Dry open soil, southern Maine, southern New Hampshire and southern Vermont south to South Carolina, inland across New York to southwestern Ontario and northern Ohio. The following are representative. MAINE: Topsham, *Chamberlain*, no. 556; Brunswick, July 25, 1901, May 25, 1912, *Kate Furbish;* Cape Porpoise, May 25, 1895, *Fernald;* North Berwick, May, 1892 and 1893, *Parlin;* South Berwick, June 13 and 14, 1896, *Parlin & Fernald.* NEW HAMPSHIRE: Haverhill, *Fernald.* no. 15,542; Derry, May 10, 1913, *C. F. Batchelder;* Hampton Falls, May 21, 1914, *Batchelder;* Mason, May 15, 1915, *Batchelder;* Merrimack, June 4, 1917, *Batchelder;* Walpole, May 26, 1917, *Bean & Fernald;* Jaffrey, *Robinson*, no. 470; Hinsdale, May 15, 1919, *Batchelder.* VERMONT: Putney Mt., Brookline, May 31, 1915, *L. A. Wheeler;* Westminster, *Robinson*, no. 102; Rockingham, May 26, 1917, *Woodward & Wheeler.* MASSACHUSETTS: West Manchester, June 7, 1913, *F. T. Hubbard;* Ashby, May 30, 1914, *Knowlton;* Boxborough, *Hubbard & Torrey*, no. 495; Lexington, *Day*

& Fernald in Pl. Exsicc. Gray. no. 100; Milton, May 13, 1900, *Churchhill;* Marshfield, June 6, 1909, *Knowlton;* New Bedford, May 24, 1903, *Hervey;* Barnstable, *Fernald & Long*, no. 16,877; Eastham, *F. S. Collins*, nos. 2011, 2018; Nonamesset, *Fogg*, no. 2677; West Tisbury, *Seymour*, no. 1232; Nantucket, *Day*, no. 20; Leominster, May 30, 1914, *Fernald & Bean;* Southbridge, May 20, 1916, *Churchill & Woodward;* Brookfield, May 16, 1913, *Fernald & Hunnewell;* Greenfield, May 10, 1912, *Batchelder, Kennedy & Williams;* Ware, May 16, 1922, *Knowlton;* Chicopee, May 18, 1913, *Murdock & Torrey;* New Marlboro, July 24, 1912, *R. Hoffmann.* RHODE ISLAND: Providence, May 8, 1904, *E. F. Williams;* Barrington, May 30, 1911, *Fernald;* Warwick, May 2, 1908, *Hope;* Westerly, August 31, 1919, *Weatherby & Collins;* Block Island, *Fernald, Long & Torrey*, no. 9657, *Beattie*, no. 4803. CONNECTICUT: Franklin, July 4, 1912, *Woodward;* Southington, *Andrews*, no. 226; Waterbury, *Blewitt*, no. 691; Salisbury, June 9, 1906, *Fernald;* Fairfield, May 12 and July 31, 1907, *Eames;* Bridgeport, April 25, 1897, *Eames.* NEW YORK: Pelham, May 5, 1886, *D. W. Parker;* Dryden, *Eames & MacDaniels*, no. 4310; Ithaca, *Wiegand & Metcalf*, no. 4309, *Bechtel & Wiegand*, no. 6702; Spencer, *Dean & Eames*, no. 4311. PENNSYLVANIA: West Philadelphia, May 17, 1923, *Meredith.* MARYLAND: Harper's Ferry, April 17, 1890, *S. Watson;* Bladensburg, July 6, 1913, *Steele* (transition to var. *villosissima*). DISTRICT OF COLUMBIA: Takoma Park, May 5, 1899, *T. A. Williams;* Sheridan's Creek, Washington, May 29, 1913, *Steele.* VIRGINIA: Mt. Vernon, *Pease*, no. 7413; Hot Springs, *Hunnewell*, no. 4026. SOUTH CAROLINA: Summerville, *Robinson*, no. 253. ONTARIO: Tillsonburg, *J. Macoun*, no. 34,428. OHIO: Newell Ledge, Portage Co., *R. J. Webb*, no. 5244. Apparently crosses with *P. simplex.*

Forma **ochroleuca** (Weatherby), n. comb. *P. pumila*, forma *ochroleuca* Weatherby, RHODORA, xi. 153 (1909).—Petals cream-colored. Known only from the original station (now obliterated), at Cambridge, Massachusetts.

Var. **villosissima**, n. var., caulibus petiolis pedunculis calicibusque longe villosissimis, villis laxe divergentibus vel reflexis; foliolis maturis 1.5–6 cm. longis.—Virginia, Tennessee and Missouri; doubtless elsewhere.[1] VIRGINIA: between Warrenton and the hills, April 19, 1913, *Tidestrom*, no. 6226. TENNESSEE: top of Cade's Cove Mt., Blount Co., May 20, 1928, *W. A. Anderson, Jr.*, no. 911; three miles north of Coal Creek, Anderson, April 6, 1928, *W. A. Anderson, Jr.*, no. 726. MISSOURI: common on hills, Monteer, May 13, 1901, *Bush*, no. 453 (TYPE in Gray Herb.); common in woods, Monteer, *Bush*, no. 186; Rhyse, Dent County, May 9, 1927, *J. H. Kellogg.* Var. *villosissima* is the *P. caroliniana* Rydb. N. Am. Fl. xxii[4]: 303 (1908), not Poir. in Lam. Encyc. v. 595 (1804).

[1] Introduced, undoubtedly with earth accompanying roots of trees or shrubs from the Ozark area, into the Arnold Arboretum, Jamaica Plain, MASSACHUSETTS (*E. J. Palmer*, no. 28,014).

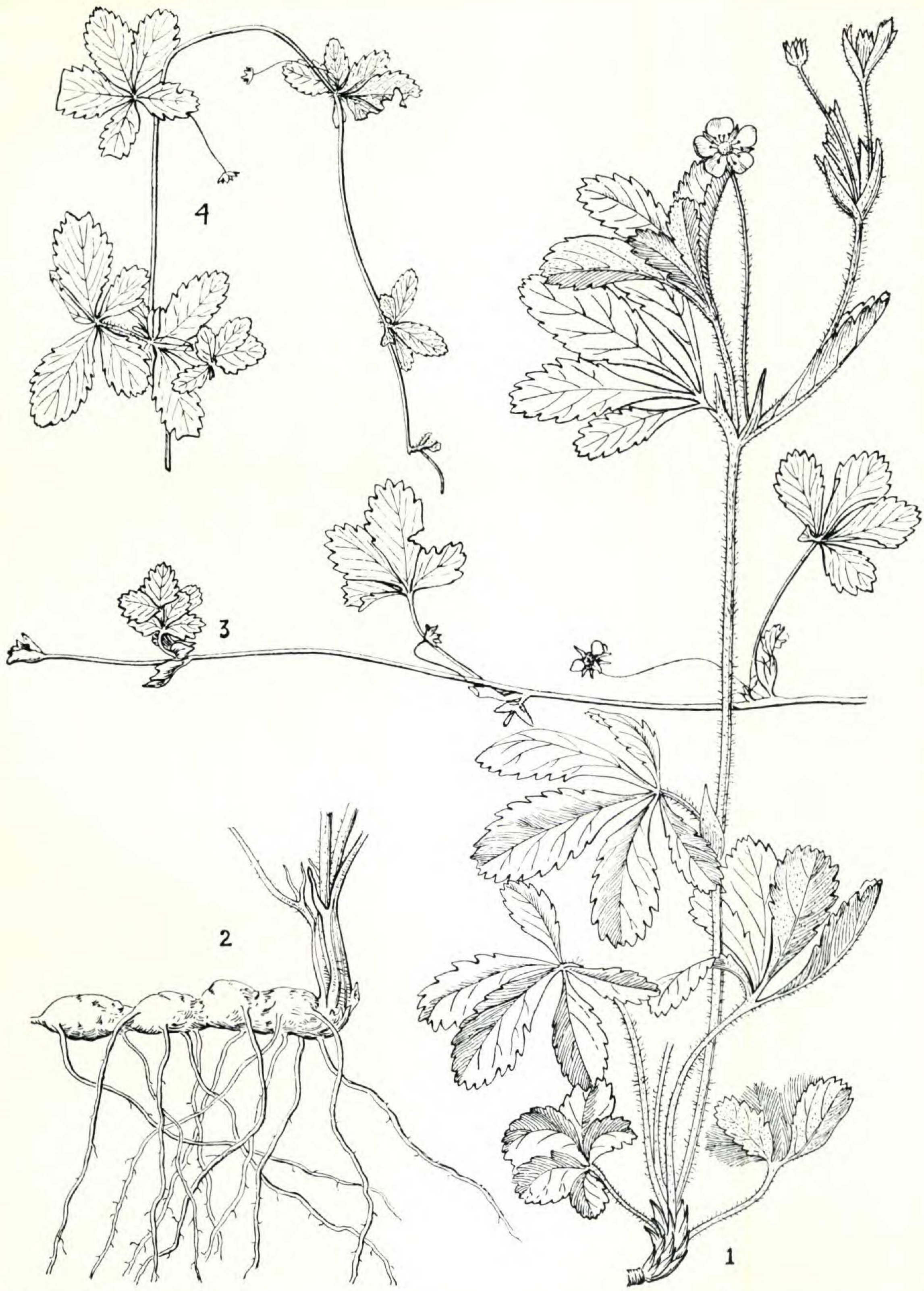
P. SIMPLEX Michx. Coarser than *P. canadensis:* rhizome irregularly enlarged, often nodose or moniliform-thickened, up to 8 cm. long, 0.5–2 cm. thick: stolons late in the season bearing tuberous enlargements (young rhizomes), especially at the rooting tips: stems at first erect or ascending, up to 2–5 dm. high, then greatly prolonging, arching, forking and rooting at tips, 1–3 mm. thick at base: cauline leaves during anthesis mostly well expamded (those subtending flowers 1.5–10 cm. long, including the petiole, at expansion of the flower); their leaflets narrowly obovate, narrowly elliptical or oblanceolate; the middle leaflets of the largest leaves (of each plant) 1.5–7.5 cm. long, 9–27 toothed for about three-fourths their length: free blades of basal stipules linear-lanceolate, long-attenuate, usually inrolling; stipules (simple or cleft) of mature primary cauline leaves 0.7–3 cm. long: first flower usually from the node above the second well-developed internode: petals obcordate or retuse: first flowers expanded in eastern Massachusetts April 30–June 23.

Three pronounced varieties.

Leaves green and more or less strigose-pubescent or slightly whitened but not copiously silvery-sericeous beneath.
  Stems (especially when young) hirsute or villous-hirsute, with spreading hairs.....Var. *typica.*
  Stems strigose with short appressed hairs or glabrate....Var. *calvescens.*
Leaves densely silvery-sericeous beneath: pubescence of stems spreading, usually dense.....Var. *argyrisma.*

Var. **typica.** *P. simplex* Michx. Fl. Bor.-Am. i. 303 (1803); Nestler, Mon. Pot. 40, t. ix. fig. 2 (1816); Eaton, Man. ed. 2, 379 (1818); Lehm. Mon. Gen. Pot. 142 (1820); Bigel. Fl. Bost. ed. 2: 204 (1824); Hook. Fl. Bor.-Am. i. 192 (1834). *P. caroliniana* Poir. in Lam. Encyc. v. 595 (1804), not Rydb. N. Am. Fl. xxii[4]. 303 (1908). *P. sarmentosa* Muhl. in Willd. Enum. Hort. Berol. 554 (1809), in part (sheet no. 1 in Willdenow Herb.). *P. canadensis,* β. *simplex* (Michx.) T. & G. Fl. N. Am. i. 443 (1840), at least as to name-bringing synonym. *P. canadensis* Rydb. Mem. Dept. Bot. Columb. Univ. ii. 35 (1898), N. Am. Fl. xxii.[4] 303 (1908) and in Britton & Brown, Ill. Fl. ed. 2, ii. 251, fig. 2230 (1913); Robinson & Fernald in Gray, Man. ed. 7: 484 (1908); not L. Sp. Pl. i. 498 (1753).—Dry to moist open soil of fields, thickets, open woods, etc., central Nova Scotia and southwestern New Brunswick to southern Quebec, southern Ontario and Minnesota, south to North Carolina, Tennessee, southern Missouri and Oklahoma. The following are characteristic. QUEBEC: Deschênes sur la riviére Ottawa, *Rolland,* no. 15,505; Longueuil, *Victorin,* no. 3248. NEW BRUNSWICK: St. Andrew's, June 16, 1900, *J. Fowler;* NOVA SCOTIA: Bridgewater, *Fernald & Long,* no. 23,961 (late-summer state, with lateral leaflets uncleft, distributed as *P. pumila*). MAINE: Isle au Haut, July 12, 1920, *Kidder;* Rockland, *C. A. E. Long,* no. 570; South Poland, 1893, *Kate Furbish;* Cape Porpoise, May 25, 1895, *Fernald,* NEW HAMPSHIRE: Stratford Hollow, *Pease,* no. 13,574;

Fig. 1 (upper). Type of Potentilla canadensis in Linnean Herbarium.
Fig. 2 (lower). Specimen in Kalm's Herbarium in Upsala (photograph from Professor H. O. Juel.)



H. M. Gilkey del.

Fig. 1. Type of Potentilla simplex, × ¾, after *Nestler*. Fig. 2. Rhizome of P. simplex, × ¾. Fig. 3. P. sarmentosa, × ⅖ (sheet no. 2 in Herb. Willdenow). Fig. 4. P. sarmentosa, × ⅖, (sheet no. 1 in Herb. Willdenow).

Lebanon, June 3, 1887, *Kennedy;* Woodstock, *Fernald,* no. 11,728; Hampton Falls, June 4, 1916, *C. F. Batchelder;* Walpole, June 12, 1912, *Batchelder;* Hinsdale, June 9, 1920, *Batchelder.* VERMONT: North Haven, May 25, 1879, *Brainerd;* Middlebury, June 4, 1908, *Kennedy;* Hartford, June 12, 1920, *Eaton & St. John;* Rutland, *Eggleston,* nos. 1195–1197; Westminster, *Robinson,* nos. 101, 102. MASSACHUSETTS: Andover, *Pease,* no. 3649; Sudbury, May 24, 1918, *Knowlton;* Middlesex Fells, June 9, 1920, *Kidder;* Boxborough, *Hubbard & Torrey,* no. 463; Wellesley, May 31, 1899, *Rich;* Westwood, May 30, 1899, *Kennedy;* West Stoughton, May 22, 1909, *Blake;* Fall River, May 27, 1910, *Sanford;* Sandwich, *Fernald & Long,* no. 18,563; Eastham, *F. S. Collins,* no. 2094; Worcester, *Wiegand,* no. 1083; Erving, May 14, 1915, *Hunnewell, Macbride & Torrey;* South Hadley, June 10, 1926, *Knowlton;* Granby, May 29, 1910, *Knowlton;* Chicopee, *Murdoch & Torrey,* no. T439; Russell, *St. John & White,* no. 124; Adams, May 15, 1915, *Knowlton & Bean;* Sheffield, May 30, 1919, *Bean & Fernald.* RHODE ISLAND: Cumberland, May 29, 1904, *Williams;* Providence, *Chamberlain,* no. 80; Foster, June 10, 1922, *Eaton & Fassett;* Johnson, May 30, 1911, *Collins;* Block Island, *Fernald, Long & Torrey,* nos. 9600, 9656, 9658 (distributed as *P. pumila*). CONNECTICUT: Thompson, June 10, 1922, *Bill & Grigg;* Hebron, *Weatherby,* no. 4094; Meriden, May 17, 1903, *L. Andrews;* Huntington, June 5, 1902, *Eames;* Stratford, June 9, 1901, *Williams.* NEW YORK: Lisbon, *Phelps,* no. 1403; Brooklyn, June 2, 1885, *L. M. Parker;* Canadice, *C. C. Thomas,* no. 4312. NEW JERSEY: Stelton, *Halsted,* no. 128. PENNSYLVANIA: Sellersville, April 30, 1921, *Fretz.* DELAWARE: Newark, May 11, 1922, *Meredith.* VIRGINIA: White Rock Mt., June 21, 1892, *Small;* Covington, *Hunnewell,* no. 4032; Buckroe, *Robinson,* no. 474. ONTARIO: Belleville, May 24, 1878, *J. Macoun;* Leamington, *J. Macoun,* no. 34,409; Amherstburg, June 10, 1882, *Macoun.* OHIO: Newell Ledge, Portage Co., *R. J. Webb,* no. 5253; Oberlin, May, 1890, *Kofoid;* Sugar Grove, May 20, 1905, *Gleason.* KENTUCKY: Rice Station, Estill Co., *W. A. Anderson, Jr.,* no. 467. TENNESSEE: Elkmont, *W. A. Anderson, Jr.,* no. 843; Oliver Springs, *Anderson,* no. 955; Hollow Rock Jct., *Svenson,* no. 381; Memphis, *E. J. Palmer,* no. 17,276. MICHIGAN: Turin, June 20, 1901, *Barlow;* Douglas Lake Region, *Ehlers,* no. 361; Grand Rapids, 1900, *E. J. Cole.* ILLINOIS: Peoria, June, 1903 and 1904, *McDonald;* Muncie, May 24, 1908, *Gleason;* Decatur, *Gleason,* no. 217; Starved Rock, *Greenman, Lansing & Dixon,* no. 52. MINNESOTA: St. Paul, *Beach,* no. 102. IOWA: Fayette, June, 1894, *Fink.* MISSOURI: St. Louis Co., May 16, 1877, *Eggert;* Cedar Gap, *Lansing,* no. 2973. KANSAS: Cherokee Co., *Hitchcock,* no. 675. OKLAHOMA: Page, *Stevens,* no. 1478.

Var. **calvescens**, n. var., caulibus petiolisque strigosis vel glabratis; foliis subtus strigosis vel glabratis.—Newfoundland, Cape Breton and Prince Edward Island to the Laurentide district of Quebec, and west to Minnesota, south to South Carolina, Illinois and Oklahoma. The